

REMARKS

Applicants respectfully request reconsideration of the present application in view of the arguments presented herein.

I. STATUS OF THE CLAIMS

Claims 1-8 and 12-26 are pending in this application. Claims 1, 4, 12, 15, 19, 21 23 and 25 have been amended herewith. In particular, claims 1, 12, 19 and 23 have been amended to further clarify that the Ni-based metal layer for silicide is comprised of a nickel alloy. Moreover, claims 3, 9-11, 14, 20 and 24 have been canceled without prejudice.

Support for the above amendments may be found throughout the specification as originally filed. No new matter has been added by virtue of this amendment.

II. Claim Rejections under 35 U.S.C. §103

(i) Claims 1, 3-6, 12, and 14-17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,196,360 to Doan et al (hereinafter Doan) in combination with U.S. Patent No. 5,766,997 to Takeuchi (hereinafter Takeuchi).

(ii) Claims 2, 7-8, 13, 18 and 19-26 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Doan with Takeuchi as applied to claims 1, 3-5, 12, and 14-16 above, and further in view of U.S. Patent No. 6,503,840B2 to Catabay et al (hereinafter Catabay), U.S. Patent No. 6,664,166 B1 to Jaiswal et al (hereinafter Jaiswal) and U.S. Patent No. 6,775,046 B2 to Hill et al (hereinafter Hill).

In response, it is respectfully asserted that the Doan, Takeuchi, Catabay, Jaiswal and Hill references each fail to teach or suggest all of the features recited in independent method claims 1, 12, 19 and 23 of the presently claimed invention.

As stated above, method claims 1, 12, 19 and 23 have been amended herewith to further clarify that the Ni-based metal layer for silicide is comprised of a nickel alloy.

In particular, Doan, Takeuchi, Catabay, Jaiswal and Hill each at the very least fail to teach or suggest forming a Ni-based metal layer comprised of a nickel alloy for silicide as recited in method claims 1, 12, 19 and 23.

Moreover, use of a Ni-based metal layer comprised of a nickel alloy for silicide in the methods recited in claims 1, 12, 19 and 23 would not have been obvious to one skilled in the art for at least the following reasons set forth below. Namely, in the field of semiconductor fabrication, the silicide process has undergone continuous change. For example, use of titanium (Ti) silicide was largely abandoned in favor of Cobolt (Co) silicide, because Ti silicide has a low resistivity only when used in connection with large silicon substrates, thus making it unsuitable for use with highly integrated semiconductor devices. Next, cobolt silicide was subsequently abandoned in favor of nickel (Ni) silicide because cobolt silicide requires a high temperature treatment (about 800 °C) for its formation, thereby causing several difficulties with the semiconductor device, including negatively impacting on the heat budget of the highly integrated semiconductor device. Further, the cobolt silicide process has agglomeration characteristics which leads to lumping of cobolt silicide when the gate width of a semiconductor device is reduced. **(See present specification page 1, lines 18-31 through page 2, lines 1-6).**

However, even a silicide process using nickel silicide may still have difficulties. For instance, nickel silicide formed using a conventional silicide process is easily damaged in a high-temperature atmosphere. In contrast, nickel silicide formed using a Ni-based metal layer comprised of a nickel alloy, as recited in claims 1, 12, 19 and 23 has a high thermal stability in comparison to nickel silicide formed using a conventional nickel silicide technique. Accordingly, based upon the strong thermal stability characteristics mentioned above, it would not have been obvious to one skilled to form a Ni-based metal layer comprised of a nickel alloy for silicide according to the methods recited in claims 1, 12, 19 and 23.

For the reasons set forth above, withdrawal of the rejections to claims 1, 12, 19 and 23 is respectfully requested. As claims 2, 4, 5, 6-8 depend from and incorporate all of the limitations of claim 1, claims 13 and 15-18 depend from and incorporate all of the limitations of claim 12, claims 21 and 22 depend from and incorporate all of the limitations of claim 19, and claims 25

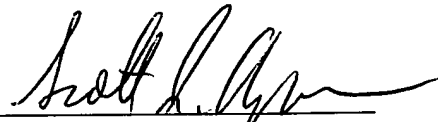
and 26 depend from and incorporate all of the limitations of claim 23, withdrawal of the rejections to these dependent claims is likewise respectfully requested.

III. CONCLUSION

For the foregoing reasons, applicants respectfully submit that the instant application is in condition for allowance. Early notice to that end is earnestly solicited.

If a telephone conference would be of assistance in furthering prosecution of the subject application, applicants request that the undersigned be contacted at the number below.

Respectfully submitted,



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